The Search for Affirming Narratives for Future Governance of Technology: Reflections from a Science-Theology Perspective on GM Futuros

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My scientific research over the last 25 years has shaped the formation of the new field of 'Soft Matter Physics'. Interdisciplinary work with chemists, chemical engineers and biologists has sought to connect molecular structure and behaviour with emergent material or biological properties. I have also worked intensively with industrial researchers developing molecular design tools for new polymeric (plastic) materials, leading large national and international programmes, with personal contributions mostly theoretical. Throughout I have also maintained an interest in public engagement with science, science policy and public values including the underlying, but often hidden, public narratives of science. I have been especially interested in the potential for theological narratives to inform debates in science and technology, both explicitly and implicitly. I explore historical, sociological and theological approaches to contribute to a long cultural narrative for science in the recent book *Faith and Wisdom in Science* (McLeish 2014), whose framework I adopt here in a reflection on lessons from the GM Futuros project.

The fascinating comparative research of the GM Futuros project, and the remarkable day's discussion at the Royal Society of London that followed it, underlined both widely differentiated global contexts for these contested technologies and commonalities in the experience of engaging different communities. For whether we were learning about the vexed symbolic role of maize in Mexico, the rescinding of Bt brinjal authorisations in India, or the calling for reopening of debate on GMOs in Brazil, the voices we heard were plural, often disconnected and dissatisfied with the quality of extant public process and conversation. The project also illustrated the inadequacy of any public discussion of technology which attempts to restrict the terms of debate to the evaluation and minimisation of technological risk and the maximisation of reward. As related projects have found in the context of nanotechnology, fracking and other environmentally-modifying technologies (Macnaghten 2010; Macnaghten and Szerszynski 2013), other concerns will always come into play. If these narratives are not allowed to appear explicitly within the process of consultation, then they will do so by proxy, driving the debate, but not answerable to it from their hidden position.

In research on lay ethical concerns with nanotechnologies, the European DEEPEN project identified five narratives that appeared to be central in the formation of public concerns, namely, 'Be careful for what you wish for' (the narrative of desire), 'Pandora's Box' (the narrative of evil) and 'Messing with nature' (the narrative of the sacred) joined by 'Kept in the dark' (the narrative of alienation) and 'The rich get richer and the poor get poorer' (the narrative of exploitation) (see Davies et al. 2009; Macnaghten et al. 2010). The philosopher Jean-Pierre Dupuy has developed a metaanalysis of the five narratives identifying the former three as 'ancient', in so far as they focus on the relationship between humans and 'nature' (or metaphysical entities) and the latter two as 'modern' in so far as they are concerned with political questions of power, access and distribution. Nevertheless, whether ancient or modern all five narratives are cast uniformly in a 'tragic tone', with little positive reflection on the underlying motivations of science. Furthermore, they tend to be implicit, rather than explicit, in any technological debate. So proponents of technology attempting progress at a level of simple risk analysis will simply be talking past any voices propelled by these deeply-swimming stories of warning. We seem to possess no alternative narrative which might engage and

work with them. The only narrative to hand, with a positive technological direction, is that the 'modernist instrumentalist' which presumes that science will inevitably lead to enlightenment and social progress, which fails to mount any effective challenge because it rather than simply refutes them.

In the context of environmentalism more broadly, Latour has also pointed out that there is a lack of credible alternative to two extreme responses to the challenge of anthropogenic environmental decline: an impossible withdrawal from 'Nature' on the one hand, and implausible further technological 'fix' on the other (Latour 2007). His conjecture is that: 'The real question is to have the same type of patience and energy as God the Creator Himself' and his appeal to the serious work of engaging technology using theological resources – what he describes as the need to love the technology we have created – comes as surprising, even shocking, to a contemporary readership. Yet his point is to urge a marshalling of resources that will drive an understanding of the true interdependence that 'mastery' (of Nature or of anything else) requires. To interfere and then withdraw, or to create and then abandon, is a technological transgression of potentially disastrous consequences. But Latour is not simply advocating another partner to the narratives of evil, the sacred, or desire. Nor is he working at an abstract or theoretical level – theology, certainly the best theology, can be intensely practical.

The 'missing narrative' implicit in the work of the DEEPEN project, Dupuy and Latour, if there is one, needs urgently to be discovered and explored. Here I draw on an interdisciplinary approach to a third narrative resource – that of the ancient wisdom literature. After hearing that Pandora is alive and well in discussions around nanotechnologies, and that theology is needed to lead technology back to its environmental responsibility, perhaps this does not seem impossibly strange. I have developed the substance and consequences of a scientist's reading of the timeless and remarkable Book of Job elsewhere (McLeish 2014), but it is worth revisiting here for its strong resonance with both the present and absent narratives of the relationship between the human and nature, and as an alternative source of ancient narratives on which to reflect on the findings of GMFuturos. It might also be offered as one of the resources that Latour's project of a 'theology of technology' could feed on. The book of Job in the old testament is a text deeply and continually concerned with the natural world, and within its device of legal debate between contested voices (those of Job, his 'comforters' and ultimately that of God himself) creates an area in which different accounts can engage. The text offers six differentiated views of human response to the natural world that emerge from its complex discourse. It is striking, both how closely they map onto the narrative categories of the DEEPEN project in general, and how they serve more specifically as categorising tools when listening to the plural voices of GMFuturos:

(1) *Enshrining retributive moral law*. The well-known accusation of Job's comforters is that the suffering he has undergone must have resulted from his own wickedness (or from that of others closely related to him). In this brittle (and ultimately condemned) view, nature provides unequivocal returns on investment – good for good and harm for harm. But this closely parallels the narrative of exploitation. It surfaces today as well: in the GM Futuros research with Mexican actors, fears surfaced of genetically altered food being 'not good' that it will 'case harm and problems' and that such consequences are due to human greed.

(2) *Eternal Mystery*. Invoked in the text as a device to silence Job's demands for justice as inappropriately arising from a darkened mind, this is an ancient form of the 'kept in the dark' narrative that frames nature as forever hidden and human ignorance as a permanent state. It is of course profoundly antithetical to natural philosophy and science, yet it still surfaces today. Even in the scientific communities we interviewed, there was expressed a doubt that we understand enough of the genome (of, *e.g.* maize) to be confident about modifying it.

(3) *Book of Nature*. This form of the narrative of the sacred endows nature with coded messages for humans to read. In Job, natural phenomena are appealed to metaphorically in support of moral standpoints. We learn from nature but we do not attempt to modify our teacher. So an articulate voice, from a consumer's association in Mexico, advocated learning from the barriers to gene transfer that nature has enshrined.

(4) *Uncontrolled chaos*. The view of nature as capricious and out of control is that of the unjustly suffering Job himself. Essentially the root lies in the text of the link between the moral and cosmic worlds; Job's accusation is that God allows wild and damaging excesses in nature (the storm, the flooded wadi, the earthquake) as he does of the moral sphere (innocent suffering). One professional group we interviewed in India spoke of the inability to control nature, 'Something, anything, can happen…' even appealing to ancient (Mahabharata) mythology in support of their warning

(5) *Object of worship*. Unfamiliar to the modern world, this response to nature is also only hinted at in the text, where Job denies "kissing his hand to the moon". But intransigent modern denials that such a reaction is ever an issue today look less convincing when arguments appeal, even implicitly, to the narrative of 'sacred nature'. 'We reject the approval of Bt brinjal. We traditionally save our own seeds and consider them as sacred' affirmed an Indian farmer in our study.

(6) *Way to wisdom*. There is another response to the natural world that the ancient text on Job describes in a way that differs radically from all the foregoing in its radical openness, and in its elevated view of both human responsibility and human potential. I have elsewhere called this narrative the 'Way to Wisdom' (McLeish 2014). It draws on a coherent dualism of knowledge paired with insight into nature, whose historical arcs connect with contemporary science and technology. However it brings these strands of understanding Nature's structures and wisdom in using them, in much closer and more complex relationship than the linear and unidirectional framing currently exemplified in national science policies and strategies. It also affirms that it is deeply significant of human nature to interrogate and to husband the world. Bringing into life as yet unrealised potential within nature is not necessarily an inappropriate 'playing God', providing that it is not driven by an anthropocentric avarice. The essential rebalancing, in this radical narrative, of a purely exploitative manipulation of the world is provided by the twin imperatives of an ethics of human responsibility and an aetiology that centralises and prioritises the wellbeing of the world before the wealth of human beings. It provides a worked answer, rooted in very long tradition, to Latour's call for a 'servant mastery' in relation to the environment. Some of the more thoughtful reflections of scientists as identified in the GM Futuros research represent a path that balances openness to the new with recognition that care is needed to avoid unanticipated consequences – so in Brazil, for example, we heard, 'it is necessary to use technologies in an integrated and combined manner. The exclusive use of a specific technology can lead to imbalances', yet, 'Genetic Modification is seen as allowing for the indefinite extension of human intervention in nature.'

The challenge is to create a functional contemporary connection between an approach that draws on the 'Way to Wisdom' and the process of policy-creation around troubled technologies such as

GMOs. The potential to break the current forms of deadlock evinced in all the examples of GMFutoros, no less that in the current UK and EU, is provided by its doubly-radical content. On the one hand it makes a positive affirmation that human intervention in nature can be both a good, and supportive rather than destructive of the human condition. On the other it challenges and ultimately condemns any framing that makes its principle goal the material benefit of people, in this case, the 'feeding of the world' narrative. This must be secondary to a deliberate prioritisation of a sustainable world. Introducing a set of principles built on such values within a fraught contest between 'technological progressive' and 'ecological conservative' voices sides with neither. It contains fundamental directions that both will embrace, yet presents both with severe challenges as well. But, like all third views, it also diverts the deadlocked opposition characteristic of all discussion that has been reduced to a simple dualism.

Such are the potential benefits of reframing the value-structure of debate around an explicit, rather than implicit, set of underlying narratives. But any implementation begs severe questions of process and definition. How should the prioritisation of 'responsible care' for nature be articulated, weighted and defined? How can a language of negotiable underlying narrative be developed, and deployed? How can the different levels of discussion and consultation recognise multiple levels of motive that play out, whether we make the explicit or not, and in particular how can a positive narrative such as the 'Way to Wisdom' be led to engage with, for example, 'Pandora's Box' in a way that unlocks a real deliberation about new technology rather than an entertaining sideshow? If nothing else, we need to create a deliberative framework that recognises the sterility of any idea that all that needs to be discussed is the level of risk.

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